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AI in Border Control. Opportunity or threat?
An analysis of Artificial Intelligence practices in border control in EU's Member States

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I hereby declare that I have composed the present thesis autonomously and without use of any other than the cited sources or means. I have indicated parts that were taken out of published or unpublished work correctly and in a verifiable manner through a quotation. I further assure that I have not presented this thesis to any other institute or university for evaluation and that it has not been published before.

June 11th
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Abstract

This paper studies the intersection between Artificial Intelligence, border control and migration. To do this, I examined the various approaches employed by different European Union countries in border control and the AI Act, proposed by the European Commission to regulate the rapid growth of AI technology. To analyse this, I converted qualitative data about these countries into numerical form. I categorised the data into four distinct groups based on AI: 1) biometric identification (automated fingerprint and face recognition); 2) emotion detection; 3) algorithmic risk assessment; and 4) AI tools for migration monitoring, analysis, and forecasting. Then, I have analysed which EU's member states are implementing or have implemented these types of AI within their borders, as well as the funding they've received towards implementing such measures, comparing, and contrasting border and interior countries. One of the main conclusions drawn by this analysis is that exterior countries are more prone to use AI tools for migration monitoring, analysis and forecasting while interior countries tend to use algorithmic risk assessment.

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Introduction

The intersection of AI, border control, and migration is a crucial area of study with implications for security, governance, and human rights. I have chosen this topic for my master's thesis not only because it is significant and relevant in the present academic and professional environment, but also as a way to combine my background in International Relations with EU Policy specifically around migration. I am passionate about migration studies and how the field is being impacted by new technologies such as AI. My motivation to contribute to the larger conversation and advance our understanding of this complicated topic is also fueled by the research's practical application and the importance that both topics now have in the European atmosphere.

Artificial Intelligence (AI) is revolutionising all aspects of life, from the most mundane to the most complex. The use of this new tool, which is becoming more and more available to everyone, means a radical change in the way we live. However, along with the positive impacts of AI in many fields, important concerns are emerging. In the academic conversation on AI, both positive and negative impacts have been identified, and with them, the need to carefully study these impacts has risen to ensure that AI is used responsibly and ethically.

The European Commission's AI Act is the first law aiming to regulate AI systems by a major regulator (Bolk, A., 2023), therefore, it will set a precedent for other countries and international organisations to follow in the future (Molnar, P., 2023). Thus this paper will examine the current AI Act proposed by the European Commission and highlight its implication towards people on the move, how it might affect them and provide possible modifications to the act. Furthermore, AI is very broad and difficult to delimitate. That is why I have chosen to divide it into four main subsections, they are: 1) biometric identification (automated fingerprint and face recognition); 2) emotion detection; 3) algorithmic risk assessment; and 4) AI tools for migration monitoring, analysis and forecasting (Dumbrava, C., 2021). This paper will encompass an analysis of migration experimentation undertaken by various nations, as documented by reputable sources such as the Algorithmic Fairness

for Asylum Seekers and Refugees (AFAR) Project, Migration+TechMonitor and The Guardian. These sources examine the distinct approaches by a few selected countries, as well as the utilisation of artificial intelligence in border control measures within national boundaries and at international borders. Subsequently, I will draw conclusions as to whether the member states of the European Union demonstrate sufficient variation to be delineated as two distinct groups, with primary differentiation made on the basis of their status as either primary receptors of migrants -border countries, or recipients of migrants -interior countries, who do not serve as primary points of entry for migrants. This thesis delves into an examination of the financing of projects by the European Union, providing a comprehensive analysis of how funds are allocated among public, private, and other entities. Specifically, the focus is on the top 10 recipients of EU funding, highlighting their significant role in receiving financial support. The study further explores key programs operating in AI border control and migration, shedding light on the disparities that exist between border and interior countries.

The main issues with the AI Act related to the use of artificial intelligence in the context of migration will also be discussed and analysed in this thesis. The possible effects of the AI Act on current AI methods in border and migration control will be investigated, drawing on the knowledge acquired from diverse sources. Notably, each country has documented unique uses of AI, demanding a country-specific study to comprehend the various consequences of the AI Act across various countries[1].

Therefore, the purpose of ethical review for AI systems includes safeguarding human rights and ensuring the safety and well-being of those who might be affected by their use. This is key regarding sensitive topics such as migration, asylum and border control due to the vulnerability of the people affected (Molnar, P. & Gill, B., 2018). In addition, ethics in AI systems also involve ensuring that both the development and use of the technology are fair and

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[1] This does not mean that these AI practices are being implemented at the moment, rather that they have been implemented at some point

impartial, and that bias and discrimination in its application are avoided. The need to regulate and monitor the development and use of AI to prevent its misuse or inappropriate use has also been highlighted within migration contexts.

Literature review

Finding pertinent research can be difficult since the use of artificial intelligence in border control is a relatively new field. However, due to its importance, more authors are now writing about its uses and possible dangers, especially when intertwined with human rights and migration. Petra Molnar is one of the main authors of this intersection between AI and migration and human rights.

In one of Molnar's papers called *Technology on the margins: AI and global migration management from a human rights perspective (2019)*, she describes how these technologies are not sufficiently regulated and developed, especially regarding transparency and accountability. Molnar (2019) emphasises the lack of international regulation for the technology utilised in controlling migration, and this absence of regulation has implications for human rights, and how States intentionally target the migrant population as a useful testing ground for new technologies. Under the pretence of national security, or even in the name of humanitarianism and development, the use of greater technology and data collecting seems to become justifiable in order to make migrants more trackable and to understand their behaviour as a group. Molnar is also the author of *Technological Testing Grounds. Migration Management Experiments and Reflections from the Ground Up* (2020) where she highlights that the increase in population migrations across the world has led to technological development in fields including border control, decision-making, and data analysis. Examples include using AI-based lie detectors at borders and leveraging big data to forecast population migrations. These technology innovations frequently fail to consider the possible repercussions on human rights and everyday life. Finally, one of her latest publications *Territorial and Digital Borders and Migrant Vulnerability Under a Pandemic Crisis* (2022) analyses how

emerging technological concerns in migration management are not just about the technology itself, but also about how and by whom it is utilised, with states and commercial players defining the parameters for what is feasible and whose priorities are important.

There are also some NGOs which have voiced their opinions on the topic such as 'Access Now' with *The EU AI Act must protect people on the move* (2023) written by Caterina Rodelli. The report explains how the damages resulting from the application of AI in the context of migration are neither effectively addressed by the EU AI Act or prevented by it. It also points out that it is crucial that, regardless of their immigration status, everyone is protected by the EU AI Act against dangerous applications of AI systems.

The Organisation for Economic Co-operation and Development (OECD) and the European Migration Network published a paper called *The use of Digitalisation and Artificial Intelligence in Migration Management* (2020) examining how several nations have used AI technology into their immigration and border control processes for a variety of reasons. The BAMF in Germany utilises an AI program named DIAS to recognize Arabic dialects and collect data on the nation of origin. For the purpose of determining linguistic competence throughout the citizenship process, Latvia uses AI-based voice recognition. While Germany, the United States, Australia, and Canada use AI for identity validation and fraud detection, the Netherlands' Immigration and Naturalisation Service (IND) uses algorithms to spot document fraud. The TIKKA project from Finland uses open-source data, artificial intelligence, and human analysis to verify applicants' identities. Artificial intelligence is used in Lithuania and Hungary for border inspections and foreign national identification, respectively. Additionally, the 'iBorderCrtl' initiative, sponsored by the EU, uses AI-powered avatars to pose filtered questions to travellers at border crossings in Greece, Hungary and Latvia.

Other organisations such as the Canadian Internet Policy & Public Interest Clinic (CIPPIC) published in 2020 *Facial recognition at a crossroads: Transformation at our borders and beyond.* The clarity of face recognition

algorithms in detecting travellers depends on their confidence threshold, as illustrated in this report. A low threshold may detect more travellers, but it may also produce more false positives, or identifications that are incorrect. Though it may miss some travellers, a high threshold has fewer false positives. In border control, reducing false positives is frequently prioritised in order to prevent admitting the wrong individual. Racial bias in facial recognition technologies can also be present and disproportionately harm vulnerable populations. When assessing the value and effect of a face recognition technology in border control, accuracy and racial prejudice must both be taken into account because accuracy numbers may not reflect these biases. Edward Santos (2020) in *Can artificial intelligence be trusted with our human rights?* further elaborates on how dark-skinned persons are far more prone to be subject to a mistake in facial recognition. This might have disastrous effects on police, aggravating past injustices that have disproportionately affected people of colour. The England and Wales Court of Appeal voiced grave concern in August 2020 on the potential effects on human rights of a face recognition system being tested by the South Wales Police.

Dumbrava, C. (2019) discusses how the European Union (EU) and its Member States are increasingly using artificial intelligence (AI) technology to enhance border security and address security concerns related to cross-border terrorism and serious crime. This reliance on AI technology reflects their efforts to improve security measures and reduce potential threats at the borders. Biometric technologies for identity verification or identification are being rapidly incorporated into the centralised information systems for borders and security inside the EU. The Schengen Information System, the European Dactyloscopy Database (Eurodac), and the Visa Information System are the three information systems that currently use automated fingerprint identification technology; the Entry/Exit System and the European Criminal Record Information System for third-country nationals will both use it in the future. All EU information systems, with the exception of one, the European Travel Information Authorisation System, are anticipated to process facial photographs in the near future for the purposes of identification and/or

verification. Automated face recognition technology (FRT) is not yet employed in any EU information system.

Tyler, H's (2022) *The Increasing Use of Artificial Intelligence in Border Zones Prompts Privacy Questions* mentions that the European Union has a strong interest in utilising AI technology to monitor the Mediterranean Sea, which is considered one of the challenging maritime borders.The Roborder project, which was finished in 2021, sought to create an AI-powered autonomous surveillance system employing unmanned robots in the air, on land, and in the ocean to find criminal activities and potential environmental problems. While improving situational awareness and border control may be advantageous, there are worries about the EU's policy toward migrants and the possible abuse of AI monitoring. Aerial surveillance and collaboration with the Libyan Coast Guard are two instances of actions that have sparked ethical and human rights issues. In order to ensure the proper and moral use of these technologies, substantial thinking and precautions are required when using AI for border control. Other projects such as iBorderCtrl, part of Horizon 2020, were meant to expedite and simplify border clearance for visitors from outside the EU entering the Schengen Area. A two-part process was envisioned, the first stage taking place before travelling and featuring a brief interview with a digital avatar, and the second stage taking place while travelling and involving a portable device that examined travel papers and made use of face recognition technology. Tests for AI lie detection would be used in both phases. iBorderCtrl was designed to enhance the current capabilities of border control officers and speed up procedures, much like the Roborder project. The project underwent six months of testing in 2018, however iBorderCtrl was never used to conduct border crossings.

Projects such as FOLDOUT prioritise movement variations and detection in different parts of the EU. Foliage penetration is a crucial aspect of border monitoring. Furthermore, other projects such as CENTAUR (Cost Effective Neural Technique for Alleviation of Urban Flood Risk) and HYPERION are part of the Recovery and Resilience Facility (RFF) and the Greek National of the

Internal Security Fund - Borders and Visa (ISF-BV). The RRF systems should be finished by the fourth quarter of 2024 and are a part of a larger investment that focuses on the digitalization of the immigration and asylum system (European Commission, 2022). Beginning in 2020, two projects—Hyperion and Centaur—began to track people entering and exiting state-run refugee camps and feed CCTV and drone images to a control centre built up inside the Ministry of Migration and Asylum. The former project used behavioural analysis algorithms to track people entering and exiting the camps. Both Hyperion and Centaur have previously come under fire from humanitarian organisations who claim they run the risk of denying asylum seekers their fundamental rights and liberties. With the use of money from the EU's Recovery and Resilience Facility, Balkan Investigative Reporting Network (BIRN) and Solomon can now expose that both were developed and first put into action without first hiring a data protection officer at the Ministry of Migration and Asylum, as required by the GDPR to provide proper monitoring (Fotiadis, A., Papangeli, I., & Malichudis, S., 2022).

Moreover, different non-official EU platforms such as Migration+tech monitor[2] are investigating the use of artificial intelligence, automation, and surveillance technologies to identify and track persons who are moving. This platform has created a continuously expanding repository of research on migration and technology by exploring and examining how these technologies are being used on the ground, as well as by giving voice to the perspectives of those who have been directly impacted by border tech projects. Additionally, Ozkul, D. (2023) *Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum Governance in Europe* has also provided a map identifying new uses of technology[3] regarding migration across Europe. I will analyse these maps in Chapter 2. Dr. Ozkul (2023) also reflects on how new technologies are increasingly being used in the sectors of immigration and

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[2] https://www.migrationtechmonitor.com/
[3] In this research, "new technologies" is defined broadly as "tools used for automation of processes that were previously carried out by humans, using simple closed-rule algorithms, as well as more complex artificial intelligence (AI) systems."

asylum throughout Europe. Deciding who has access to their territory, their defence mechanisms, or their borders, is increasingly becoming depersonalised as some governments have begun utilising (or testing) these new technologies. To the advantage of government agencies and some applicants, the application of new technology, particularly automated decision-making systems, can speed up the decision-making processes. They could, however, also create new types of vulnerabilities. While the use of new technologies has the potential to speed up some decision-making procedures, the inherent bias, discrimination, and potential "machine mistakes" they may introduce pose a serious threat to migrants and asylum seekers who are already disenfranchised and find it difficult to seek redress.

Finally, Kilpatrick, J & Jones, C. (2022) *A clear and present danger. Missing safeguards on migration and asylum in the EU's AI Act* present a clear overview of the AI Act, with particular attention paid to how it affects migration and the objections voiced by civil society to its "risk-based approach." The briefing goes into further detail on how EU institutions and member states are now using AI systems for things like immigration management, border security, and asylum. It addresses how these might be regulated (or not) under the proposed AI Act and describes the key use cases, potential threats to basic rights, and regulatory options. The paper also provides details on the sizable public funds that the EU has allotted for the study and development of AI technology connected to border control which will be discussed in depth in Chapter 4.

Methodology

The methodology proposed in this article comprises performing a qualitative research to look at the procedures used by various European Union member states within the EU's borders. The main goal is to investigate potential differences in strategies between interior nations like Germany and France and border nations like Greece, Italy, and Spain. The research seeks to shed light on the many dynamics and factors that are at play inside the EU through an

exhaustive analysis of these practices, providing a fuller comprehension of the various strategies used by member states to handle border-related issues.

The data used for the methodology has been extracted from three main sources:

1) Migration+tech monitor (MTM), an archive that compiles the different AI uses diverse countries and their specific AI implementation case by case. MTM is a community of journalists, filmmakers, scholars, and worldwide communities that expose the experiences of migrants impacted by developing border technology. They are formed by: The Promise Institute for Human Rights from UCLA School of Law, Lighthouse reports, Privacy International, Refugee Law Lab, Homo Digitalis and Kenyajade. They are also partnering with Truth on Borders and often collaborate with European Digital Rights.

Figure 1 shows the map elaborated by MTM where each location is linked to a specific AI use in border control and migration. The map only shows information about the European Union as that is the scope of this paper. Their work, however, expands beyond the EU.

Figure 1. Mapping border tech in Europe
Source: Migration Tech Monitor

2) Ozkul, D. (2023) *Automating Immigration and Asylum: The Uses of New Technologies in Migration and Asylum Governance in Europe* also shows different measures taken by different member states of the EU and non-member states such as UK and Turkey. This article also identifies practices that have been halted such as Risk assessment for the processing of visitor visa applications in the UK or that are still under development, being tested or currently under revision. This is the case of document verification in Belgium and France, assessment of appeal cases' type and complexity in the Netherlands and screening of employment sponsorship also in the Netherlands.

Figure 2 shows the map used by this article to highlight the uses of AI in the different countries of the European Union and neighbouring countries such as the UK, Norway and Turkey.
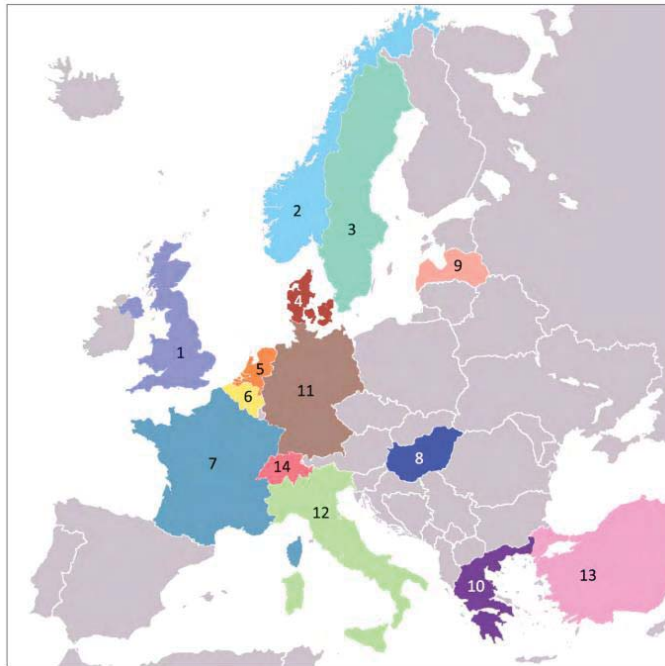
Figure 2. Identified uses of new technologies across Europe
Source: Ozkul, D. (2021)

3)Ahmed, K. and Tondo, L. (2022) *Fortress Europe: the millions spent on military-grade tech to deter refugees* published in The Guardian has depicted the outcome of the EU's investment: a technical playground for military and tech corporations recycling goods for new markets, and a digital wall on the harsh sea, forest, and mountain boundaries.

Figure 3 shows the specific map of this publication which is centred in the eastern part of the European Union, emphasising the use of air surveillance, sensors and cameras, surveillance centres, deterrents and AI lie detectors.

Figure 3. Specialised technology to monitor borders and deter refugees
Source: Ahmed, K. and Tondo, L. (2022). Guardian research

Hence, this study intends to discover important discrepancies in the use of AI technologies within the context of border movement by utilising the data and insights gathered from the chosen so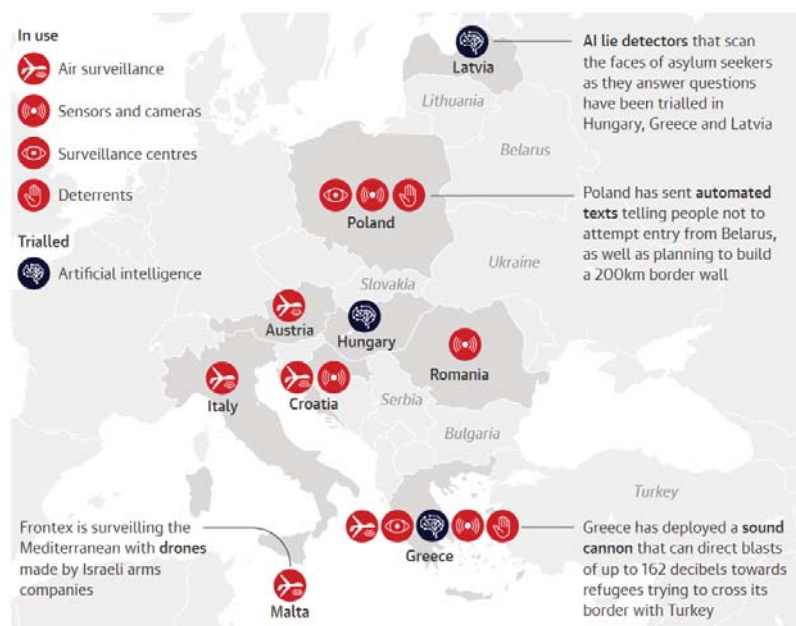urces. The goal is to analyse how interior nations like Germany and France vary from border nations like Greece, Italy, and Spain in terms of how they have integrated AI in border control. This study seeks to shed light on these discrepancies in order to compare and contrast how the use of AI in border management may affect the migration landscape within the European Union taking into account elements like migration trends, border control tactics, and socio-political situations. In this paper, I have gathered the available information from the three main sources of information mentioned above in Figure 1, Figure 2 and Figure 3. Using data from those three sources, I have created a new map quantifying all the AI methods proposed by the different sources into four different types: 1) biometric identification (automated fingerprint and face recognition); 2) emotion detection; 3) algorithmic risk assessment; and 4) AI tools for migration monitoring, analysis and forecasting. These are the main distinctions of AI according to Dumbrava (2021).

I will be able to learn important things by combining a variety of sources and turning qualitative data into a quantitative framework. This will allow me to see the variations in the action measures used by the Member States. We could find any significant differences and trends that could show up when we look at these indicators from a geographic perspective by combining and analysing the data. We shall divide the Member States into two different groups: border and interior countries. Having these groups makes it easier to conduct a thorough examination as I will be able to speculate how geographic variables may affect the acceptance and application of various AI technologies in border control management. I hope to identify any observable trends or connections by contrasting and analysing the strategies used by these two groupings. This analysis can assist in determining if geographical factors have a substantial impact on the methods and decisions made in relation to the use of AI technologies for border control.

The first cluster of countries, situated at the borders of the EU, will consist of: Bulgaria, Croatia, Cyprus, Greece, Italy, Malta, Portugal and Spain (Idemudia, E. & Boehnke, K., 2020). The second cluster of countries, those who are interior within the EU, consists of: Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia and Sweden. How these countries are situated within the EU affects the routes often taken by people on the move. The first cluster of countries is frequently the initial European destination for people on the move, while the second cluster tends to be their second or third European destination after arriving in the European Union (EU) or interior countries.

Chapter 1. Regulating Artificial Intelligence

<u>1.1 The AI Act</u>

The Artificial Intelligence Act was proposed by the European Commission in April 2021. It was brought forward due to the rising concerns about the protection of fundamental human rights, security and safety (European Parliament, 2023). The following specific goals are included in the Commission's proposed regulatory framework for artificial intelligence: (1) ensuring that AI systems used and sold in the Union are safe and uphold existing law on fundamental rights and Union values; (2) ensuring legal certainty to encourage investment and innovation in AI;(3) improving governance and effective enforcement of existing law on fundamental rights and safety requirements applicable to AI systems and finally; (4) promoting the growth of a single market for ethical, reliable, and safe AI applications to avoid market fragmentation. The proposed regulations will be implemented through a governance system at the level of the Member States that builds on current frameworks and a mechanism for collaboration at the level of the Union with the creation of a European Artificial Intelligence Board (European Commission, 2021).

Article 114 of the Treaty on the Functioning of the European Union (TFEU) serves as the proposal's legal basis, which calls for the adoption of measures to safeguard the creation and operation of the internal market. The Regulation's direct application under Article 288 of the TFEU will lessen legal ambiguity and make it easier to create a single market for ethical, reliable and safe AI systems. This regulation is also supposed to strengthen the protection of fundamental rights and give operators and consumers alike legal certainty by introducing a harmonised set of core requirements with regard to AI systems classified as high-risk and obligations for providers and users of those systems (European Commission, 2021).

Furthermore, stakeholders have largely contributed and have been key in the development of the categorisation of AI. Aside from defining the word "AI,"

stakeholders stressed the significance of defining "risk," "high-risk," "low-risk," "remote biometric identification," and "harm". The majority of respondents openly support the risk-based strategy as it was seen to be preferable to blanket regulation of all AI systems. Sector-by-sector and case-by-case analysis should be used to determine the sorts of risks and hazards. According to the proposed AI Act, there are four categories of danger associated with AI systems: unacceptable risk, high risk, restricted risk, and low or negligible risk[4]. This strategy enables customised regulation, ensuring that stringent regulations are only applied to AI applications when they are required to reduce certain levels of risk.

The impact on rights and safety is one of the crucial elements which need to be taken into account when calculating the risks, the implementation of AI could entail (European Commission, 2021). As mentioned before, the use of AI can put in serious jeopardy fundamental rights such as the ones enshrined in the EU Charter of Fundamental Rights due to its opacity, complexity, dependence on data, and autonomous behaviour. With a clearly defined risk-based strategy, the Commission intends to handle diverse sources of risk while ensuring a high degree of protection for those essential rights.

By using a risk-based strategy, this idea seeks to safeguard basic rights that are adversely affected by AI. It focuses on the standards for reliable AI and the responsibilities of all value chain actors. Human dignity (Article 1), privacy and data protection (Articles 7 and 8), non-discrimination (Articles 21 and 23), gender equality (Articles 11 and 12), freedom of expression (Articles 11 and 12), freedom of assembly (Articles 11 and 12), and the right to a fair trial (Articles 47 and 48) are among the rights that are intended to be protected. In addition, it covers the rights of employees (Article 31), consumers (Article 28), children (Article 24), and people with disabilities (Article 26). Public health and environmental protection (Article 37) are also pertinent. To reduce the possibility of biassed judgments in crucial areas, the plan includes requirements for testing, risk management, and human oversight.

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[4]AI Regulatory Framework (Figure I in the ANNEX).

Transparency, traceability, and efficient redress methods are made available in the event of violations. In order to protect the public interest, avoid safety hazards, and violated rights, restrictions on the freedom of speech (Article 16) and the freedom of the arts and sciences (Article 13) are put in place. Increased transparency duties are compliant with the trade secret laws while respecting the protection of intellectual property (Article 17(2)) and providing the data required for oversight and recourse. Access to private information by public authorities and notified bodies is subject to secrecy obligations (European Commission, 2021).

All these possible breaches of fundamental rights can have different impacts depending on who is affected. For vulnerable groups of people such as people on the move, a breach of fundamental rights can pose much graver problems. Thus the use of AI systems upon migrants is being contemplated in the AI Act.

1.2 The AI Act regarding migration

The procedural requirements outlined in Directive 2013/32/EU of the European Parliament and of the Council, Regulation (EC) No 810/2009 of the European Parliament and of the Council, and other pertinent legislation should be followed by AI systems in the field of migration, asylum, and border control management, as covered by this Regulation (European Commission, 2021). The provider must show compliance with the standards provided in Chapter 2[5] of the rule in the context of migration, particularly for high-risk AI systems mentioned in point 1 of Annex III. The supplier must follow one of two processes if they adhered to the standardised requirements outlined in Articles 40 or 41 or both: a) A conformity assessment based on internal control, as defined in Annex VI; or b) a conformity assessment based on a notified body's evaluation of the technical documentation and the quality management system, as defined in Annex VII. However, the provider must adhere to the conformity assessment process indicated in Annex VII if they have not or have

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[5] It outlines the legal requirements for high-risk AI systems in respect to data and data governance, documentation and record-keeping, user information provision and transparency, human supervision, robustness, correctness, and security.

only partially implemented harmonised standards, if there are no relevant harmonised standards, or if there are no common specifications. The provider may select any notified body for the evaluation during the conformity assessment method described in Annex VII. However, the market surveillance authority mentioned in Article 63(5) or (6), as applicable, will operate as the notified body where the AI system is intended to be utilised by law enforcement, immigration or asylum authorities, or EU institutions, organisations, or agencies (European Commission, 2021).

Concrete examples of high-risk AI systems related to migration are automated decision-making systems, predictive analytics, surveillance technology, biometric identification systems, and technologies used in migration management (European Commission, 2023). The proposed EU AI Act currently includes a list of Annex III's high-risk AI systems used in border and migration control, but it leaves out other AI-based systems that have an impact on people's rights and should be subject to supervision and transparency requirements (Tyler, H., 2022). In order to fix this, important safeguards against harmful applications of AI in migration were widely supported by the civil liberties and internal market committees of the European Parliament's AI Act.

In their vote on the AI Act on May 11, 2023, the internal market and civil liberties committees of the European Parliament unanimously supported crucial safeguards against dangerous applications of AI in migration, prohibits damaging AI applications and requires more stringent controls for "high-risk" applications. These are the new additions to Article 5's restriction against: 1) emotion recognition technologies that expressly go across EU boundaries. Based on presumptions about how people behave while feeling a given way, emotion identification systems promise to be able to identify people's emotions, including judging their believability; 2) biometric categorization systems that categorise people based on their personal traits and utilise those traits to guide assumptions and 3) predictive policing systems, which decide how to police particular groups and areas based on prior beliefs about who

poses a risk. All of these technologies are founded on irrational, frequently biassed, and discriminatory presumptions, which subsequently guide actual decision-making that has a negative and significant impact on people's lives (Press release PICUM, 2023).

The application of AI systems in border control, asylum, and migration management has a substantial influence on those people in vulnerable situations who depend on the judgement of capable public authorities. To maintain the basic rights of individuals impacted, including the rights to freedom of movement, non-discrimination, privacy, personal data protection, international protection, and good administration, it is imperative to ensure the accuracy, fairness, and transparency of these AI systems. Certain AI systems must be labelled as high-risk when utilised by public agencies in charge of managing immigration, asylum, and border control in order to allay these worries. Systems for assessing the risks posed by people entering a Member State or applying for a visa or asylum are examples of these systems. Other examples include systems for confirming the authenticity of pertinent documents and systems that assist authorities in examining applications for asylum, visas, residence permits, and related complaints to determine eligibility.

Chapter 2. Uses of AI in border control

Digitally based governance and administration have recently become increasingly popular throughout industries, offering quicker and more effective services as well as logical, impartial solutions. This also applies to security governance, with instances including machine learning-based predictive policing, automated information collecting and pattern analysis. These ideas have been put into practice by the EU in the form of smart borders, which include integrated IT infrastructures and systems for border control. This includes tools like electronic gates, self-service terminals, computerised security screenings, and centralised databases containing trip data and biometric identifications. They make border crossings quicker and easier for EU citizens and people with passports from nations with pre-existing visa agreements, but more challenging, if not impossible, for people without permits or the appropriate passport, most notably for people seeking asylum who must first enter the country they want to seek asylum in (Martins, B., Lidén, K., & Jumbert, M., 2022).

2.1 Possible data-use related biases

The implementation of Artificial Intelligence is opening its path also in processes related to border control and migration. However, the implementation of this tool can create problems due to pre-existing bias in data collection among others, which would skew and perpetuate systemic racism against the people in our borders.

Connecting the pre-existing data among countries is key for AI. From this need, the term interoperability was born. Interoperability is the fundamental capability of various computerised goods or systems to quickly connect and share information with one another, in either implementation or access, without limitation (HEAVY.AI, n.d.). The Interoperable Europe Act proposal was approved by the European Commission on November 21st, demonstrating the EU's dedication to putting interoperability into practice inside its borders. By promoting collaboration between EU Member States and Institutions, this act

intends to make it possible for secure data sharing and cooperative digital solutions. The EU hopes that encouraging interoperability would result in considerable cost reductions for those using public administrations as well as enterprises. In addition to an Interoperable Europe Portal and measures to foster innovation, the legislation provides obligatory evaluations. The framework will be governed by the Interoperable Europe Board, which is made up of representatives from the European Economic and Social Committee, the Committee of the Regions, the Commission, and the Member States. Generally speaking, the EU's emphasis on interoperability aims to improve coordination and effectiveness within its digital ecosystem (Verdi, G., 2022). The interoperability rules establish a "single, overarching EU information system" in relation to the "identity data" of non-EU citizens. Simultaneously, the databases supporting the new "interoperable" systems are being changed in an effort to locate and deport those who are present in the Schengen region illegally more quickly and effectively. This is done by processing more personal data collected from more people for a wider range of purposes. Undocumented immigrants and other non-EU nationalities might have substantial consequences (Jones, C., 2019). The interoperability initiative's facilitation of more police identity checks for non-EU citizens, whether they have documentation or not, is one of this initiative's primary goals (Martins, B., Lidén, K., & Jumbert, M. G., 2022). To achieve this, a sizable new database called the Common Identity Repository (CIR) is being built using information from a variety of current and upcoming EU databases. The CIR has a capacity of up to 300 million entries comprising biographic and biometric data. Additionally, the CIR's design violates an important data protection concept. The information that it will contain—at least one biometric identity and fundamental biographic

information—must be taken from a variety of current and upcoming systems (EES[6], ETIAS[7], EURODAC[8], SIS[9], VIS[10], and ECRIS-TCN[11]).

Through the introduction of a system called the Multiple Identity Detector (MID), this data will be subject to extensive, automated cross-checking to try to detect the use of multiple identities by non-EU nationals, in addition to being used to facilitate identity checks and aid in criminal investigations via the CIR.

Biometric indicators were previously gathered, examined, and categorised manually using non-digital techniques. The precision of this labour-intensive operation depended on the operators' expertise and the administrative systems' efficiency. However, the development of digital technology made it possible to automate the collection and evaluation of biometric data. As a result, specific IT systems and network infrastructure were created. The first automated fingerprint identification system (AFIS) was developed using IBM punch cards in the 1940s, but fully automatic systems didn't appear until the 1960s and optical scanners until the late 1980s. Other biometric technologies, such as face image recognition, iris recognition, and DNA profiling, are being researched and tested in addition to fingerprint identification. The expanding usage of facial recognition has been spurred by developments in artificial intelligence. Facial recognition technology is highly valued for criminal identification and public monitoring, in addition to consumer uses like tagging images and unlocking electronics. It is converting border checkpoints into comprehensive surveillance systems that track and identify people at many points throughout their path. AI is also being used for emotion recognition, risk assessment, migration tracking and analysis, and decision support systems in fields including borders, migration, and security (Dumbrava, C., 2021).

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[6] Entry-Exit System
[7] European Travel Information and Authorization System
[8] European asylum dactyloscopy (fingerprints) database
[9] Schengen Information System
[10] Visa Information System
[11] The European Criminal Records Information System Convicted Third Country Nationals

New technologies have an impact on the procedures and results of decisions that would otherwise be made solely by administrative tribunals, immigration officers, border agents, legal analysts, and other officials in charge of managing refugee response, enforcing borders, and administering immigration and refugee systems. The impact on people's rights and interests is frequently very significant, there is a high level of deference to immigration officer decisions and lax procedural safeguards, because border enforcement and immigration and refugee decision-making sit at an uneasy legal nexus (Molnar, P., 2020). The prevalent and significant risk that AI may violate human rights is one of the main worries about its deployment by legal entities. For instance, the rights to privacy, equality, particularly gender equality, and non-discrimination may be at jeopardy if AI technology is not used properly. The usage of AI may be unreasonable or excessive, or it may be done unintentionally, such as when machine learning algorithms are trained with biassed data that leads to unfair choices that discriminate against certain people or groups (UNICRI & UNCCT., 2019).

Discrimination may result from algorithmic bias. Due to their potential for wide application or because of feedback loops, they also have the potential to intensify prejudice. This will typically only happen when training data, coded parameters, or input data contain features that explicitly identify a protected characteristic. For example, when a predictive policing algorithm includes data on the ethnicity of residents in a specific neighbourhood or when a content moderation algorithm includes data on the ethnic origin of a particular post's author. (*Bias in algorithms: Artificial Intelligence and Discrimination*, 2022)

The EU passed two measures in 2019 that vastly expand the possible use of immigration data systems (together with information on criminal histories) to investigate severe crimes and immigration enforcement. In order to allow for interoperability—that is, to allow the underlying databases to be connected in a way that ostensibly supports more effective law and immigration enforcement—these regulations provide a legal basis for the construction of a new layer of architecture on top of the current migration databases (PICUM,

2020). The six databases that serve various purposes for border control are: EURODAC (for asylum seekers and irregular border apprehensions), Visa Information System, Schengen Information System, ECRIS-TCN (for foreign nationals with a criminal record), ETIAS (for travellers from visa-exempt countries), and the Entry-Exit System (for identifying visa overstays). This interoperability architecture, nevertheless, poses certain questions. It implies an inappropriate connection between immigration and major crimes like terrorism by focusing primarily on non-EU citizens. Second, it is difficult to educate people about data usage, correction procedures, and remedies for errors or abuses due to the complexity of interconnected databases, which raises the likelihood of errors. These new methods and their implications for people's rights are difficult for lawyers and data protection agencies to comprehend (PICUM, 2020).

However, we could claim that the issue is far more complicated than that and that the problems we are facing are more deeply rooted. According to Martins, B., Lidén, K., & Jumbert, M., (2022), there is no fundamental EU policy on how to treat migrants properly, despite the fact that there is extensive talk about addressing biases in algorithms that regulate all aspects of social life, including migration. While EU policies may appear to be fairly balanced on paper, in reality, much of their application depends on the policies of the individual member states and the EU's backing of those policies through EU organisations like Frontex. There is no fair foundation to return to once the digital distortions are "corrected," efforts to improve the EU migration management's fairness will always fall short (Martins, B., Lidén, K., & Jumbert, M., 2022).

Chapter 3. Migration experiments

According to Statewatch.org (2022), since 2007, the EU has invested €341 million in research into artificial intelligence technologies for border, asylum, and immigration control. Nevertheless, the proposed AI Act presently being discussed in EU institutions falls short of offering adequate protections against dangerous use of those technologies.

The use of Artificial Intelligence in border control differs greatly from one country to another. In this subsection, the different practices that the EU Member States are carrying out will be analysed following the distinction mentioned above where all AI uses will be divided into four different subcategories: 1) biometric identification (automated fingerprint and face recognition); 2) emotion detection; 3) algorithmic risk assessment and 4) AI tools for migration monitoring, analysis and forecasting.

Regarding biometric identification, only Portugal was found to be implementing this type of AI in Lisbon's airport. According to *Frontex Testing "Biometrics on the Move" Border Check Technology at Lisbon Airport* (2019), this was a trial in an effort to determine if biometric technologies may reduce wait times at crossings, tests at the Lisbon Airport Authority will focus on EU citizens exiting the Schengen Area. However, according to a press release from Frontex, "Biometrics on the Move" is the future of border controls for the European Union. Frontex claims that "Biometrics on the Move" would make it simpler for visitors to swiftly pass through border inspections without even having to pull out their passports or other documentation. The technology was created in an effort to facilitate border crossing for visitors while simultaneously enhancing security.

Furthermore, there are more countries that have implemented or are implementing emotion detection, usually crystallised in lie detection. AI lie detection has been used in countries such as Greece, Hungary and Latvia according to Migration+tech monitor, Ozkul, D. (2023) & (Ahmed, K. & Tondo, L., 2022). In all the cases through an EU-funded initiative that uses innovative

technology to provide quicker and more complete border inspection for foreign persons entering the EU called iBorderCtrl (*What is iBorderCtrl?*, n.d). Some organisations have criticised the iBorderCtrl initiative claiming that it infringes fundamental rights and that the employment of AI lie detectors at borders is unethical. Nevertheless, iBorderCtrl project was given 3.5 million euros as part of the EU's Horizon 2020 research initiative (Breyer, P., 2021). The iBorderCtrl system examined facial expressions in an effort to identify telltale signals of deception by a border agent. Psychologists have generally pronounced that polygraphs and other technologies designed to identify falsehoods based on bodily characteristics are unreliable. Soon, iBorderCtrl issues started to be reported as well. The lie-prediction algorithm's failure to operate was reported in the media, and the project's website admitted that the technology "may imply risks for fundamental human rights." (Johnson, K., 2022). It's not clear whether iBorderCtrl is presently in use, the most recent data on the project's webpage dates back to 2019 and 2022.

Algorithmic risk assessment refers to the conducted practices at EU borders as part of passenger data interchange, the VIS (and future ETIAS), and other related contexts. The results of risk evaluations and analyses may be extrapolated using aggregate data from all information systems (Dumbrava, C., 2021). The countries falling into this category are Belgium, Denmark, Estonia, France, Germany, Italy, the Netherlands, and Sweden.

In Belgium and France, there is an ongoing implementation of a tool that involves the confiscation of mobile phones from asylum seekers. This technology seeks to do thorough data copying from the mobile phones of asylum seekers, including unaccompanied minors who may not have legitimate identity documents, similar to the approach in Denmark from February 2015. This effort aims to identify people and collect data that will be useful during the asylum procedure (Ozkul, D., 2023).

In Denmark, since February 2015, the Danish police have been confiscating mobile phones belonging to asylum seekers and conducting extensive data copying. This practice, which has been described as "almost complete copying"

also applies to unaccompanied asylum seeker children who lack valid identification documents, with the aim of identifying them (Ozkul, D., 2023).

Estonia has also implemented different techniques concerning the establishment of identity for third-country nationals in migration procedures. Mobile phones and other gadgets are frequently seized during the migration process, according to a 2017 investigation by European Migration Network (EMN). This strategy demonstrates Estonia's dedication to comprehensive identification procedures and the use of technology to compile crucial information (Ozkul, D., 2023).

In Germany, if an asylum seeker is unable to provide a passport or suitable substitute documents, the Federal Office for Migration and Refugees (BAMF) is granted the authority to conduct a "data carrier evaluation". This evaluation entails extracting and analysing data from the asylum seeker's mobile phone and other devices to verify the claimed origin and identity of the owner (Gesellschaft für Freiheitsrechte, 2020). In addition to this practice, Germany has also initiated testing a new voice recognition software since 2017, aiming to identify Arabic-speaking migrants who may falsely claim to be Syrian to improve their chances of obtaining asylum. However, linguists caution that relying solely on an automated system may present challenges, as language and vocabulary are continuously evolving (BBC, 2017).

In Italy, speech recognition technology has been tested for transcribing interviews with asylum seekers. The Ministry of the Interior collaborated with a Rome-based private technology company specialising in digital voice processing and text analysis. The software developed by the company allows for recording, streaming, and automatic transcription of interviews, capturing dialects, accents, foreign terms, and spontaneous speech with an accuracy level of at least 95%. While currently implemented only in Italian, the software has the potential to transcribe and translate over 24 languages, primarily European (Ozkul, D., 2023).

The Netherlands has a wide range of AI practices regarding border control. In order to increase screening procedures and boost efficiency, a variety of instruments and techniques are being used in the asylum and migration fields. The evaluation of employment sponsorship is one such metric that is now being revised. The importance of document verification in confirming the legitimacy of presented papers cannot be overstated. An evaluation mechanism for appeal cases is being created to ascertain the nature and complexity of each case. Extraction of data from mobile phones is another important activity that helps with the gathering of relevant data. Additionally, efforts are still being made to test and create matching capabilities for these technologies in order to filter comparable asylum petitions and ease settlement procedures. Together, these projects seek to improve the administration of the asylum and migration systems by streamlining procedures, improving accuracy, and all around streamlining (Ozkul, D., 2023).

Last in this category, Sweden's Migration Agency has automated residency application assessments using in-house algorithms. The rule-based system handles tasks such as age verification and work permit eligibility checks. When faced with ambiguous situations, human involvement is sought, as stated by an agency official. Caseworkers follow and verify each step, intervening when the binary framework cannot provide a clear outcome (Ozkul, D., 2023).

Finally, AI tools for migration monitoring, analysis and forecasting. An increasingly popular method for border control is AI-assisted analyses of migration trends and cross-border crime trends (threat identification and risk analysis). Several EU agencies deploy artificial intelligence technologies and services at EU borders to track, analyse, and anticipate migration trends and security risks (Dumbrava, C., 2021). The countries falling into this category are Austria, Croatia, Denmark, Germany, Greece, Italy, Malta, Poland, Portugal, Romania, Spain and Sweden.

Austria has prioritised improving border security through the application of innovative AI technologies. It is also using AI methods to track and analyse migration trends and cross-border crime patterns, with a special emphasis on

air surveillance. Austrian authorities can quickly detect possible hazards and risks thanks to this proactive strategy (Ahmed, K. & Tondo, L., 2022).

Croatia, on the other hand, has implemented a thorough strategy for border control that includes both air surveillance and a mix of sensors and cameras. This comprehensive plan, powered by AI technology, improves Croatia's capacity to track migrant flows and efficiently address any difficulties (Ahmed, K. & Tondo, L., 2022).

Denmark, specifically the Danish Refugee Council (DRC) in collaboration with IBM, developed a forecasting program that anticipates worldwide forced migration. The Foresight Project program analyses data from over 120 sources to comprehend the major displacement-causing elements, including the economics, conflict, government, environment, and population. This technology finds trends and forecasts the future using machine learning and historical data from 28 nations. With an average error margin of 8−10%, it has been successful in projecting displacement in Afghanistan and Myanmar 1-3 years in advance, despite the fact that the accuracy varies (Ozkul, D., 2023).

In Germany, the Federal Foreign Office is spearheading the PREVIEW project. This initiative focuses on developing an advanced tool that currently enables the monitoring of ongoing conflicts, with the long-term objective of creating a forecasting tool for future events. Germany's efforts in the PREVIEW project highlight their commitment to proactive measures in conflict analysis and prediction (Ozkul, D., 2023).

Greece has established itself as a centre for border control innovation by putting diverse strategies into place all throughout its territory. On the Aegean islands of Lesvos, Kos, and Leros, the European Union has invested in high-tech refugee camps. These technologically advanced camps contain advanced features like drones, infrared cameras, algorithmic motion detection systems, and even virtual reality goggles for the security personnel (Fallon, K., 2021). Additionally, Aerostat machines, or blimps, have been placed at Évros to watch the land border between Greece and Turkey. To prevent unlawful crossings,

sound cannons, also known as Long Range Acoustic Devices, are being tested close to the Greek-Turkish border (Kontogianni, B., 2021). The EU-funded ROBORDER pilot project, which aims to develop an autonomous border monitoring system using unmanned mobility robots, including airborne, sea surface, underwater, and ground vehicles, has turned the waters around Kos into a testing ground (*Roborder*, n.d.). Drones and helicopters are being used by Greece in the Balkans, while airships are flying over its border with Turkey. Furthermore, along its land border with Turkey, Greece has placed thermal cameras and sensors in addition to ground and airborne ones, efficiently monitoring the feeds from operations centres. A vehicle-mounted sound cannon with bursts up to 162 dB has been adopted to further deter border crossings (Cockerell, I., 2021). On the island of Samos, Greece has also built a very contentious refugee camp that has come under fire for having prison-like conditions. The 3,000 asylum seekers housed in this €38 million facility are tightly monitored by elaborate CCTV systems and surrounded by military-grade fences. The camp's entrance is rigorously regulated by X-rays, turnstiles, and fingerprint scanning. This one is on Samos. Greece has become a focal point for cutting-edge developments in managing refugees and border security (Ahmed, K. & Tondo, L., 2022).

Both Italy and Spain have prioritised surveillance operations in the water between their respective borders. These countries use drones and aerial surveillance techniques to strengthen border security, with the assistance of FRONTEX, the European Border and CoastGuard Agency. This way, they can efficiently monitor and patrol the waterways, maintaining the safety and security of their borders, by using cutting-edge technologies like drones. Italy and Spain are committed to enforcing border control regulations and successfully regulating cross-border marine movements, as seen by their proactive attitude to monitoring (Ahmed, K. & Tondo, L., 2022).

Malta takes part in air surveillance missions, primarily focusing on the Libyan coast. It collaborates closely with the Libyan coastguard to stop unlawful

crossings by alerting them to vessels trying to cross the Mediterranean. This joint initiative highlights Malta's dedication to solving regional migratory concerns and securing its borders (Ahmed, K. & Tondo, L., 2022).

Poland is attempting to emulate Greece's strategy in response to the continuing problem on its border with Belarus. Their plan is to build a wall that would span half of the Poland-Belarus border. Modern surveillance tools, such as thermal cameras and motion detectors, will be included in this barrier. By building more of the wall and using monitoring technology, Poland hopes to improve border security and successfully handle the issues brought on by the situation on its border with Belarus (Ahmed, K. & Tondo, L., 2022).

Romania has taken proactive measures to enhance its border security by implementing sensors and cameras. It has carefully placed modern surveillance technology along its borders after realising their significance. Authorities are able to closely monitor movements and spot any possible security risk thanks to the sensors and cameras monitoring system. These steps are mainly used for controlling cross-border activity (Ahmed, K. & Tondo, l., 2022).

Sweden, in order to meet its internal planning demands, has adopted a proactive stance by investigating forecasting methods from which PREDICT was created. It is focused on creating an algorithm using supervised machine learning methods. With the help of this initiative, the organisation hopes to forecast migration trends to Sweden, estimate processing timeframes for various case categories (including asylum, residency permits, and work permits), and forecast where migrants will settle during the year in Sweden. The Swedish Migration Agency seeks to improve operational effectiveness and strategic decision-making processes by adopting these forecasting skills, guaranteeing a well-prepared and informed approach to immigration management.

Lastly, the Augmented Reality Enriched Situation awareness for Border security project funded by the EU seeks to enhance border surveillance systems by delivering precise and thorough information to the operational teams and the tactical command and control level. This project was implemented from May 1st, 2019, to July 31st 2022. It was funded under "Secure societies – Protecting freedom and security of Europe and its citizens" and had a total cost of € 6.999.882,50. This project was tested in live conditions in Finland, Greece, Romania and Portugal (European Commission, n.d).

After codifying with a number every subcategory presented as AI, number 1 for biometric identification, number 2 for emotion detection, number 3 for algorithmic risk assessment and number 4 for AI tools for migration monitoring, analysis and forecasting, I have been able to create a map that represents these different categories and shows combinations of different categories in some countries according to the data collected from the sources previously mentioned.

Figure 4. Different AI practices in the European Union
Source: Migration+tech monitor, Ozkul, D. (2023) & (Ahmed, K. & Tondo, L., 2022).
Own elaboration

In Figure 4 we can see the different practices quantified in four different categories along the Member States of the European Union. In the case of Portugal, Latvia, Greece, Denmark, Germany, Italy and Sweden, these countries are engaging or have engaged with more than one practice within their national borders. It is also important to note that in the case of France and Belgium, in both cases document verification is still under development.

3.2 Border countries vs Interior countries practices

This paper aims to draw key differences between the uses of AI in border control between two different clusters of countries: interior and border countries. In Figure 4, shown in the previous chapter, these different practices have been codified into four different possible categories.

All the countries considered in the analysis belong to the European Union and are divided in two groups, the first cluster, exterior countries, contains Bulgaria, Croatia, Cyprus, Greece, Italy, Malta, Portugal and Spain, whereas in the second group, the interior countries, we have Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, Ireland, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Romania, Slovakia, Slovenia and Sweden will be considered. It is important to note that some countries will be missing in the analysis due to the lack of data on the use of AI within their borders.

Some conclusions can be drawn from the distinction made above. First of all, AI tools for migration monitoring, analysis and forecasting is the most widespread tool among both groups of countries. Moreover, regarding Algorithmic risk assessment, most of the countries implementing this type of AI are from the interior group of countries except for Italy. Furthermore, out of the three countries mentioned (Greece, Latvia, and Hungary) that have implemented emotion detection technology, two of them are considered exterior countries, Latvia, and Hungary. In contrast, one country, Greece, is considered an interior country. This highlights the difference in implementation of emotion detection technology among these countries. Lastly, Biometric identification only one exterior country, Portugal, has reported its use.

Additionally, when analysed through geographical lenses, we can see how most exterior countries have implemented AI tools for migration monitoring, analysis and forecasting, however it is not exclusive to this group. The same number of border and interior countries have been registered using these AI tools, however, it is the 100% of border countries whereas it is only the 46,15% of the interior countries[12]. Moreover, for algorithmic risk assessment, out of the eight countries that registered AI tools for it, only one is a border country, meaning that 87,5% of the countries registered in this category are interior

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[12] The percentages are calculated out of the totality of countries that have AI uses registered, not out of the totality of the group.

countries. Further elaborating in this distinction, regarding emotion detection, two out of three countries were exterior, leaving a 66,67% of this category to border countries. Finally, biometric identification registered 100% of border countries due to the lack of registered use of biometric identification across different countries, there is only one country in the sample.

Thus, we can conclude that the use of AI tools for migration monitoring, analysis and forecasting are widely spread through border countries as they are the first receptors of these people on the move, acknowledging that it is also widely used for interior countries. However, there is a clear differentiation in subcategory three as it is almost exclusively used by interior countries. We could argue that the prevalence of algorithmic risk assessment in determining the origin of individuals through speech or document verification is more common in countries that serve as destinations for migrants. This is a logical development, as interior countries are more likely to adopt such practices given their subsequent reception of people. Regarding emotion detection and biometric identification, there are not that many countries with these registered practices to draw a conclusive differentiation between the two clusters. The explanation for this phenomenon can be attributed to the ethical challenges posed by the use of such technologies, which have implications not only for individuals in transit but also for European citizens in the long term. The four subcategories can all be examined through the prism of human rights and transparency, but it is emotion detection and biometric identification that draw the most significant contention. However, it is worth noting that despite being less prevalent, border countries still tend to be representative of the presence of these two contentious categories, highlighting their significance.

Chapter 4. Possible impact of the AI Act on current practices and funding

<u>4.1 AI Act's impact on Member States</u>

The AI Act is being heavily debated due to the raising voices of multiple associations and NGOs who argue that the people on the move will suffer from several deficiencies in this law. It is crucial to start by looking at Article 83 of the AI Act, one of the Act's 85 provisions, in order to understand the issues presented. According to this specific article, AI technologies like automated risk assessments and biometric identification systems are immune from regulation under Article 83 despite being labelled as "high risk" within the four-tier risk hierarchy created by the AI Act. Since it is believed that hundreds of millions of non-European persons should be unilaterally excluded from the protections offered by the AI Act, this exception has drawn criticism (Lamberti, L., 2023).

This clause relates to the sizable IT databases used in migration under the EU interoperability framework, which was heavily criticised by civil society and academics for its potential to monitor non-EU individuals. These databases include or intend to include artificial intelligence (AI) systems, such as automated risk assessments inside the European Travel Information and Authorisation System (ETIAS) and the Visa Information System (VIS), that would normally fall under the jurisdiction of the Regulation (Rodelli, C., 2023). Therefore, in order to protect the basic rights of non-EU citizens and people on the move, Article 83 is of utmost importance.

A joint statement elaborated by Catarina Rodelli (2022) and comprising several institutions and NGOs such as Access now, European Digital Rights (EDRI) and PICUM, highlights the apprehensions surrounding the utilisation of certain AI systems in the context of migration and border control, emphasising the conceivable infringement upon fundamental rights. It critically evaluates the proposed AI Act for its failure to sufficiently address the most deleterious applications of AI in these domains:

1) Predictive analytic systems: these algorithms produce predictions about the possibility of "irregular migration" and may be used to proactively

obstruct or stop movements, frequently by recruiting other nations to act as gatekeepers of European borders. However, such systems run the risk of enabling harsh border control measures that prevent people from applying for asylum, put them in danger of being sent back, and infringe on their rights to freedom of movement, life, liberty, and security.

2) Automated risk assessments and profiling systems: these artificial intelligence systems evaluate the possible "risk" provided by moving people in terms of criminal activity or security issues. Their inherently discriminatory nature, however, prejudges people based on unpredictable variables or discriminatory inferences made from their particular characteristics. These actions thereby violate the rights to equality, non-discrimination, the right to an impartial jury, and the dignity of all people. They may also result in wrongful interference with rights pertaining to work, liberty, fair trials, social protection, and health.

3) Emotion recognition and biometric categorization systems: AI systems that assert to be able to recognize emotions or suspicious behaviour based just on looks, for example, perpetuate a process of racial prejudice suspicion towards people in motion. These technologies reinforce discriminatory habits and prejudices by automating prejudiced presumptions.

4) Remote Biometric Identification (RBI): used to avoid a future in which such technologies are used as deterrents and as part of a larger interdiction regime, the restriction of remote biometric identification technologies, including facial recognition, becomes essential. This could make it more difficult for people to apply for asylum and violate the duties that Member States have under international law, notably with regard to preserving the principle of non-refoulement. In conclusion, these issues highlight the potential for AI systems used in border and migration control to violate human rights, promote prejudice, and facilitate the implementation of harsh and harmful policies.

The European Parliament's civil liberties and internal market committees on the AI Act voted on the 11th of May that forecasting tools and surveillance technologies would be considered as 'high-risk' due to the potential for misuse and violations of basic rights (Press Release PICUM, 2023). Forecasting techniques may be used to support actions aimed at driving people away from borders, preventing them from finding protection, and exposing them to harm because they are frequently based on incorrect data. The more strict regulation of forecasting tools and surveillance technologies can and will have a great impact in most of the countries of the sample due to their use of these technologies in border control. According to the literature reviewed, at least sixteen countries have had registered activities related to surveillance and forecasting tools.

The legislation recognizes a broadening of the prohibition on private actors using AI for social scoring in terms of forbidden AI methods. The restriction on AI systems that exploit people's weaknesses based on their social or economic conditions is now included in the AI Act. The law also clarifies the precise purposes for which the use of such systems may be deemed strictly required in relation to law enforcement agencies' restriction of real-time remote biometric identification systems in publicly accessible locations. Law enforcement agencies are permitted to employ these technologies in extraordinary circumstances when they are useful for law enforcement, but only within well specified parameters (Bartoš, I., 2021). However, these extraordinary circumstances in the name of law enforcement can often conflict with the preservation of human rights and human dignity.

4.2 Funding and development of AI security projects

According to Statewatch's analysis of security research funding data from 2007 to 2020, a total of 51 projects seeking to develop new technologies for immigration and border control that incorporate some form of "artificial intelligence" received just over €341 million in public funding. These include automated data collection and analysis systems, biometric identification and verification technology, and autonomous border control robots (Kilpatrick, J &

Jones, C., 2022). Out of the mentioned total (€341 million), just over €181 million was given out during the Seventh Framework Programme for Research & Development (FP7, which ran from 2007 to 2013) and just over €160 million through Horizon 2020 (H2020, which runs from 2014 to 2020). The first work program for Horizon Europe will provide about €55 million for "border management" themes, continuing the trend of the development of innovative immigration and border control technology. The current research program, Horizon Europe (2021-27), is expected to do the same (Kilpatrick, J & Jones, C., 2022).

Table 1. EU research funding for border AI from FP7 (2007-13) and H2020 (2014-20)

Institution type	Total funding €	Number of participations	Funding %
Private companies	€162,627,520	187	48%
Research institutes	€78,403,180	66	23%
Higher education institutions	€54,391,797	62	16%
Public bodies	€39,522,887	62	12%
Other	€6,220,481	6	2%
Total	€341,165,865	383	100%

Source: Kilpatrick, J & Jones, C. (2022)

In Table 1 we can see that the percentage of funding that comes from private companies is almost half of the total budget - 48%. This creates a high contrast with the 12% of the budget contributed by Public bodies. This amount of private participation could also put in jeopardy and contribute as an argument against the use of AI in border control due to its lack of transparency and accountability.

Furthermore, the development of a dedicated heading for migration and border control in the 2021−2027 MFF, valued at €30.8 billion (2018 prices), has been recommended by the European Commission due to the growing importance of

the policy sectors (D'Alfonso, A.,2020). This large budgetary allocation will be distributed through two important funds. First, there will be an overhaul and strengthening of the Asylum and Migration Fund (AMF, formerly known as AMIF). Second, the Internal Security Fund's current Borders and Visa instrument will be merged with a brand-new fund dubbed the Integrated Border Management Fund (IBMF), which will also include the recently created Customs Control Equipment Instrument. Over the next seven years, this significant increase in financing will reach €34.9 billion. In fact, the budget for immigration policy has been raised by 51%, from the last €6.9 billion to €10.4 billion (*Questions and Answers: Future EU Funding for Borders and Migration – EU Monitor,* 2018).

On the one hand, the Asylum and Migration Fund (AMF), which has a budget of 9.88 billion euros, is a crucial funding vehicle for the years 2021–2027. Its goals include bolstering the EU's system for granting asylum, facilitating integration and legal migration, preventing irregular migration, and encouraging cooperation and responsibility-sharing among Member States. AMF helps to effectively manage migration and fairly distribute the burden throughout Europe by enhancing processes, standards, and support systems (*Asylum, Migration and Integration Fund (2021-2027)*, n.d.). According to UNHCR - The UN Refugee Agency (n.d.), the EU Charter of Fundamental Rights and international human rights norms need to be upheld and respected when allocating funds for immigration and asylum. Across several financing objectives, the needs of vulnerable migrants and refugees are presently not being given equal priority. It is essential to provide all-encompassing help to people who are entitled to protection under certain legal systems as well as those who need support in accordance with human rights legislation.

On the other hand, the Integrated Border Management Fund (IBMF) is a funding initiative that aims to assist the customs union and customs authorities in pursuing their goals to safeguard the financial and economic interests of the Union and its Member States, to maintain safety and security within the Union, and to shield the Union from illicit trade while facilitating

legal business activity (*Integrated Border Management Fund 2021-2027*, n.d.). The IBMF is composed of two components: the Border Management and Visa Instrument (BMVI) and the Customs Control Equipment Instrument (*Integrated Border Management Fund*, n.d.). The Financial Support Instrument for Border Management and Visa Policy (IGFV), which is part of the IBMF, aims to create and implement effective integrated European external border management, ensure a high level of internal security in the Union and protect the freedom of movement within it (Ministry of the Interior, n.d.).

Moreover, it is also crucial to understand who specifically is receiving these funds to AI security initiatives in migration and border control for a number of reasons. In the first place, it may aid in ensuring that the initiatives are being planned and carried out in a responsible and ethical manner. For instance, civil rights and private organisations have expressed concerns about the use of AI technologies at EU borders, particularly those that employ face recognition systems, and have demanded more accountability and transparency in the creation and use of these technologies (Tyler, H., 2022). Second, being aware of the financing sources makes it easier to see any possible conflicts of interest or prejudices that could affect how the initiatives are developed and carried out. Finally, understanding the sources of the projects' funding may assist guarantee that they are in line with the goals and priorities of the funding organisations as well as the general public (La Fors, K., & Meissner, F., 2022).

Additionally, further elaborating on the proposed methodology about the differentiation between border and interior countries, this distinction can also be seen through the lens of funding. The distribution of funds for border AI security research demonstrates that southern EU member states, who are regarded as "frontline" states, have received large sums- border countries in the methodology proposed. Since 2007, institutions in Spain have received a total of €44.3 million. Italy has received €38.3 million, while Greece has received €35.9 million. These numbers indicate a desire among institutions in these nations to contribute to the development of border security measures, even though the allocation of financing cannot be directly connected to a

member state's border politics. This theory is further supported by the significant boost in funding that Greek universities got during the Horizon 2020 era (2014–20), which coincided with the "migration crisis"(Kilpatrick, J & Jones, C., 2022).

Table 2. Top 10 countries by total amount of border AI research funding received

Country	Funding FP7	Funding H2020	Funding total
Spain	€34,687,558.13	€9,625,575.06	€44,313,133.19
France	€25,346,752.54	€16,399,881.09	€41,746,633.63
Italy	€24,171,382.77	€14,177,213.56	€38,348,596.33
Greece	€15,089,971.83	€20,783,446.78	€35,873,418.61
Germany	€12,994,081.76	€14,317,003.19	€27,311,084.95
Finland	€9,952,994.83	€6,868,715.50	€16,821,710.33
Portugal	€7,475,537.76	€9,211,839.69	€16,687,377.45
Belgium	€4,536,718.80	€10,431,216.52	€14,967,935.32
Austria	€4,875,762.35	€6,839,551.25	€11,715,313.60

Source: Kilpatrick, J & Jones, C. (2022)

Based on the data presented in Table 2, it is evident that the primary recipients of funding for border AI research are predominantly countries located on the borders of the European Union, with the exception of France, which holds the second position. It can be argued that the funding amount is not solely determined by the geographical location of the countries, but also by the preferences of the people on the move when choosing their desired destinations within the European Union. This explanation supports the high rankings of both France and Germany in the table. In 2018, Germany recorded the highest number of non-EU citizens who were identified as illegally present, totaling 134,100 individuals. France ranks second with 105,900 cases, while Greece and Spain reported 93,400 and 78,300 cases, respectively. Remarkably, these four Member States collectively represented 68% of the total number of individuals found to be illegally present within the European Union (Eurostat, 2019).

Furthermore, it is crucial to carefully examine the particular commercial businesses and government organisations that are receiving funding to further their participation in border AI research.

Table 3. Top 10 private company recipients of EU security research funding for border AI projects

Institution	Country	FP7 projects	H2020 projects	Total funding
Indra Sistemas	Spain	ABC4EU MOBILEPASS PERSEUS SCIIMS SEABILLA		€ 7,965,16
Ingeniería de Sistemas para la Defensa de España (Isdefe)	Spain	CLOSEYE OPARUS PERSEUS	PROMENADE	€ 7,388,55
Naval Group	France	I2C PERSEUS	CAMELOT COMPASS2020 EFFECTOR	€ 5,610,240
Vision Box	Portugal	ABC4EU	iMARS Smart-Trust	€ 5,106,09
Leonardo	Italy	FIDELITY SUNNY	MARISA PROMENADE RANGER	€ 3,292,592
Engineering – Ingegneria Informatica	Italy	PERSEUS	ANDROMEDA EFFECTOR MARISA	€ 3,278,81
Gscan	Estonia		SilentBorder	€ 2,844,875
Veridos	Germany	FASTPASS MOBILEPASS	D4FLY PROTECT	€ 2,741,780
Satways	Greece	PERSEUS	ANDROMEDA EFFECTOR MARISA PROMENADE	€ 2,661,16
ITTI	Poland	FASTPASS MOBILEPASS TALOS	FOLDOUT iBorderCtrl PROTECT	€ 2,459,745

Source: Kilpatrick, J & Jones, C. (2022)

It is worth noting that among the top 10 private companies receiving EU security research funding for border AI, 6 of them are based in countries located at the borders. Additionally, these companies hold the highest positions in the ranking presented, except for France, which aligns with the information derived from Table 2, where France secured the second position among the top 10 countries in terms of the total amount of border AI research funding received.

Furthermore, in Table 4, we observe the persistent trend mentioned earlier, which is also evident in the public institutions receiving EU security research funding for border AI projects. All the countries listed in this category belong to the first group of countries considered to be border countries, except for Finland and Romania, which significantly impacts their exposure to migration flows. Consequently, these countries receive increased funding for border control measures.

Table 4. Top 10 public institutions recipients of EU security research funding for border AI projects

Institution	Country	FP7 projects	H2020 projects	Total funding
MINISTERO DELLA DIFESA	Italy	CLOSEYE EU CISE 2020	ANDROMEDA MARISA	€4,817,83
MINISTERIO DEL INTERIOR	Spain	ABC4EU CLOSEYE EU CISE 2020 EWISA MOBILEPASS	MARISA PROMENADE	€4,589,830
MINISTRY OF NATIONAL DEFENCE	Greece	EU CISE 2020	PERSEUS ANDROMEDA ARESIBO CAMELOT EFFECTOR MARISA RANGER ROBORDER	€3,062,159
MINISTRY OF THE INTERIOR	Finland	EU CISE 2020 EWISA FASTPASS		€2,151,706

MINISTERIO DA DEFESA NACIONAL	Portugal	SUNNY	ANDROMEDA ARESIBO CAMELOT EFFECTOR MARISA	€1,801,547
MINISTERIO DA ADMINISTRAÇÃO INTERNA	Portugal	ABC4EU CLOSEYE PERSEUS	CAMELOT ROBORDER	€1,348,865
INSPECTORATUL GENERAL AL POLITIEI DE FRONTIERA	Romania	ABC4EU EU CISE 2020 EWISA FASTPASS MOBILEPASS	BorderSens BorderUAS CAMELOT CRITERIA iMARS ROBORDER SafeShore SMILE	€1,309,790
MINISTRY OF MARITIME AFFAIRS AND INSULAR POLICY	Greece	EU CISE 2020	ANDROMEDA EFFECTOR PROMENADE	€1,005,274
GUARDIA CIVIL ESPAÑOLA	Spain	PERSEUS		€915,830
EUROPEAN UNION SATELLITE CENTRE	Spain	CLOSEYE EU CISE 2020	AI-ARC PROMENADE	€792,030

Source: Kilpatrick, J & Jones, C. (2022)

Therefore, considering the aforementioned tables, we are able to deduce certain conclusions. Firstly, there exists a significant disparity in the allocation of funding by the European Union (EU) towards various institutions, particularly in regard to private and public companies. Notably, private companies emerge as the recipients of nearly half of the budget designated for AI border control and migration. Additionally, a distinction can be observed between countries situated on the borders and those in the interior, as border countries predominantly receive this funding across both the private and public sectors, with the exception of France.

Conclusion

The use of Artificial Intelligence for migration border control in the European Union borders is a reality that is having an impact on people on the move, which is the topic that has been thoroughly examined in this thesis. First, I have analysed the AI Act and its main contributions to the use of these technologies to migration. After, through the codification of four different subtypes of AI 1) biometric identification (automated fingerprint and face recognition); 2) emotion detection; 3) algorithmic risk assessment; and 4) AI tools for migration monitoring, analysis and forecasting, several differences have been discovered regarding the variety of AI practices in the European Member. For this analysis, the states will be divided into two groups: border and interior countries, along with some key disparities in the allocation of funds on behalf of the EU. The main differences between exterior and interior countries is that border countries are more likely to implement AI tools for migration monitoring, analysis and forecasting while interior countries have developed more extensively other AI technologies such as algorithmic risk assessment. This could be explained due to the different needs of the MS due to its geographical situation and migration influx. As mentioned before, these differences have also been reflected in the allocation of funding to these countries and the type of institution being financed. Primarily, I have seen higher levels of funding for private institutions rather than public bodies and secondly, out of both types, border countries are the main recipients of the EU's AI research funding for border and migration control, which could also be explained due to a radical difference in the necessity and development of different programs being developed in those mentioned countries.
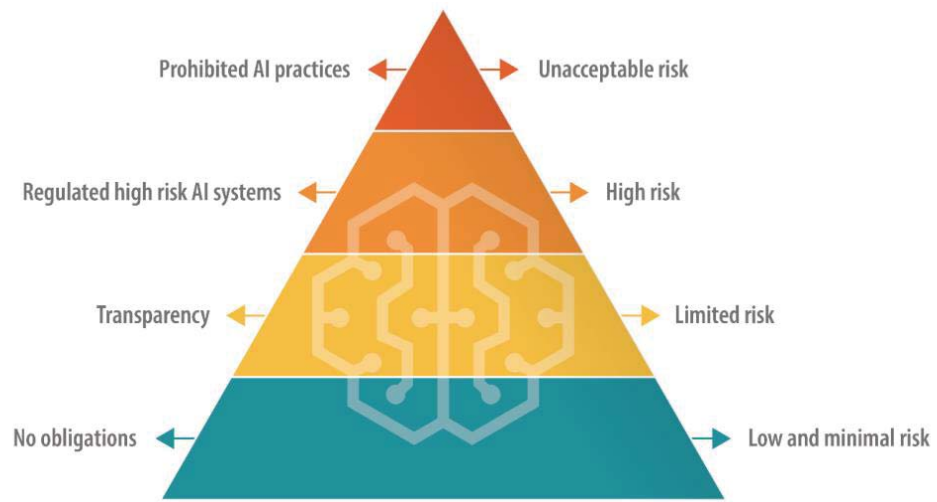
Furthermore, I have highlighted some key difficulties with the AI Act, along with the areas that still need improvement. The integration of AI in border security presents both opportunities and threats for border security and migration management, thus these factors must be carefully taken into account. Several NGOs and civil society organisations are pressuring the European Union to promote more checks and balances for the AI Act, especially

when referring to vulnerable groups such as migrants. The passing of the AI Act law will be key because it will set a precedent not only to the Member States but to the rest of the world due to its novelty. In this section, the importance of Article 83 of the AI Act has been highlighted because it claims that, despite being classified as "high risk" under the four-tier risk hierarchy established by the AI Act, AI technologies like automated risk assessments and biometric identification systems are exempt from regulation. Hence the criticism against it comes from the lack of protection for hundreds of millions of non-Europeans that would be unilaterally excluded from the safeguards provided by the AI Act.

Finally, this research contributes to the existing body of knowledge by providing valuable insights into the complexities and implications of AI in border control and migration. As technology continues to advance, ongoing research and collaboration are crucial to address emerging challenges and ensure the responsible and effective implementation of AI in this critical domain.

ANNEX

Figure I. AI Regulatory Framework

Prohibited AI practices ← → Unacceptable risk

Regulated high risk AI systems ← → High risk

Transparency ← → Limited risk

No obligations ← → Low and minimal risk

Source: European Commission

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